

in the fourth digit has the same character. The proximal phalanges of the fifth digit have not been found.

The distal or third phalanx is a broad bone, squarely truncated at the extremity, and longer than the rest of the digit, in the second, third, and fourth, and presumably in the fifth digit. Each of these phalanges is thicker on one side than on the other, so that the upper surface, which is convex from side to side, and also from before backwards, slopes from the thick towards the thin edge.

The distal phalanx of the second digit has its thick edge on its ulnar side, but all the others have their thick edges radial. The distal phalanx of the fifth digit is more pointed, smaller, and thicker in proportion than the others.

The hind foot is quite normal in structure, possessing five toes and the regular number and disposition of tarsal, metatarsal, and phalangeal bones. The third or middle digit is the longest, and its distal phalanx is the longest of all. It is nearly square, and its outer and inner edges are almost equally thick. The distal phalanges of the other toes are all thicker on the side turned towards the middle toe. That of the second toe is almost as square as that of the third; but the distal angles of that of the third and fourth are bevelled off on the fibular side, while the terminal phalanx of the hallux is similarly bevelled off upon the tibial side. The metatarsal bones have the same thick prismatic form, and the proximal phalanges the same discoidal character as in the fore foot.

The calcaneal process is directed outwards at an angle of 45° from the axis of the foot, and must have been much raised in the natural position.

While the work of restoration, whose results have just been briefly detailed, was going on, we learned from Dr. Falconer that a nearly entire specimen of a *Glyptodon* was exhibited in the Museum at Turin. An application was at once made to the authorities of the Museum for information, and, if possible, for photographs of this skeleton, and was responded to with the most obliging readiness.

These photographs of a skeleton in some respects more, in others less perfect than that of the College, have confirmed the conclusions already arrived at in the most satisfactory manner; and I trust before long to be in possession of descriptive details of parts of this specimen which are wanting in our own, and which will enable me to complete the anatomy of the skeleton of the gigantic extinct Armadillo.

ZOOLOGICAL SOCIETY.

June 10, 1862.—Professor Busk, F.R.S., in the Chair.

LIST OF MAMMALIA FROM THE CAMARON MOUNTAINS, COLLECTED BY CAPT. BURTON, H.M. CONSUL, FERNANDO PO.
By DR. J. E. GRAY, F.R.S.

CROCIDURA MORIO, sp. nov.

Uniform rather brownish black, rather paler and browner beneath.

Teeth white. Feet very slender, weak. Tail nearly as long as the body and head, very slender, annulated, covered with very short closely adpressed hair.

Length of body and head, dry, $2\frac{3}{4}$ inches; tail, dry, 2 inches.

“*Mole* from Camaroon Mountains, 7000 feet above the level of the sea, January 1862.”

SCIURUS ISABELLA, sp. nov.

Yellowish brown, minutely grizzled, with four broad dorsal streaks—the two central from the crown of the head to the base of the tail, the side ones from the shoulder only; the underside whitish grey. Tail slightly annulated.

Length of body and head 7 inches; tail 5 inches.

“*Squirrel* from the Camaroon Mountains, 7000 feet above the level of the sea, January 1862.”

I have great pleasure in naming this beautiful new species after Mrs. Isabel Burton,—her husband, the discoverer of it, having requested that any novelty that might be in the list should be so named.

ANOMALURUS BEECROFTII, Frascr.

“A *Flying Squirrel*, shot in the Camaroon Mountains, 7000 feet above the level of the sea. Colour of the eyes dark grey. January 18, 1862.”

MUS MAURA, sp. nov.

Fur very soft and silky; above black, slightly marked with brown from the minute brown tips of the hairs; beneath whitish—the hair of the underside black, white-tipped. Teeth very narrow, orange. Ears rounded, moderate. Sides of the nose and edge of the orbits black. Eyes covered with very short close-pressed hairs. Tail very long, slender, closely annulated with very slender, very short adpressed hair.

Length of body and head $4\frac{1}{2}$ inches; tail 5 inches; hind foot very nearly 1 inch.

“Camaroon Mountains, 7000 feet above the level of the sea.”

EURYOTIS IRRORATA, sp. nov.

“*Rat* from the Camaroon Mountains, 7000 feet above the level of the sea. January 1862.”

I am not certain about this species until I can compare the skull with those of the other species of the genus from Africa, as they are all very similar externally.

With these animals was sent the skin of a Chimpanzee without its skull, but with the bones of the hand and feet enclosed in the skin. This skin differs from all the other specimens of this species which I have seen, in being covered with much more abundant and softer fur, and in the fur of the back being of a brown colour, from the large brown tips to the blackish hair. It would seem to indicate a distinct variety or species, which may be designated, until we receive better specimens and more particulars, *Troglodytes vellerosus*.

June 24, 1862.—E. W. H. Holdsworth, Esq., F.L.S., in the Chair.

DESCRIPTIONS OF THREE NEW SPECIES OF PITTA FROM THE
MOLUCCAS. BY ALFRED RUSSEL WALLACE.

These birds are brought before the Society, detached from the collections of which they form a part, because a Monograph of the *Pittidæ*, by Mr. Elliot, is now in course of publication, and it is desirable that they should be described in England before appearing in a foreign work.

They are interesting as showing the permanent modifications in form of these semiterrestrial birds, in islands within sight of each other. I may mention as a curious fact, that the great island of Ceram appears to contain no *Pitta*, although one or two species occur in almost all the other islands of the Moluccan group. I have myself collected for several months in various parts of Ceram and Amboyna, without seeing or hearing of the genus; and the natives were positive no such bird was to be found in their country. The naturalists collecting for the Leyden Museum were not more successful; and recently a German ornithologist, M. Rosenberg, has resided some years in the island, and up to the time of my departure had seen no *Pitta*. This is the more remarkable, as in the little island of Banda, within sight of Ceram, a species exists which, with two others, I now proceed to describe.

PITTA RUBRINUCHA.

Head reddish brown, darker behind, where there is a subquadran- gular spot of bright red, and above it an obscure blue vertical stripe; back dull olive-green, shading into slaty blue on the wings and tail; quills blackish, with a white spot on the third and fourth; a small white spot on the shoulder; underside with the slaty-blue breast and crimson belly, exactly as in *P. celebensis*, but the black line separating the two colours is narrower. Bill blackish horn-colour; feet light dull blue; iris pale olive-brown.

Total length 7 inches; wing $3\frac{3}{4}$ inches; bill, from the gape, 1 inch.

Hab. Island of Bouru (Moluccas).

Remark.—This species is at once distinguished from its near ally, *P. celebensis*, by the red nuchal spot, and by having much less blue on the wing- and tail-coverts. It is also considerably smaller.

PITTA VIGORSI.

Pitta Vigorsi, Gould, Birds of Australia, vol. iv. pl. 2.

I had proposed a name for this species, supposing it to be new, and misled by Bonaparte's 'Conspectus,' which gives "*gula nigra*" as a character of *Vigorsi*. Having since, at Mr. Gould's suggestion, compared my bird with the type in the Museum of the Linnean Society, I find it to be the same. My specimen is a fine adult male, and differs from Gould's figure and description in having the bill entirely black, and in the red of the under parts being much mixed with black on the breast.

Total length 7 inches; wing $4\frac{3}{8}$ inches; bill, from gape, $1\frac{1}{8}$ inch.

Hab. Banda Island (Moluccas).

Remark.—The habitat “Australia” is probably a mistake, as the birds of this genus are very local, and no well-authenticated specimen has ever been received from that country.

PITTA CRASSIROSTRIS.

Similar in colour to *P. Vigorsi*; but the superciliary stripes are altogether pale rufous, the colour beneath is lighter (agreeing with *P. concinna*), and the chin is black, which colour extends in a triangle on to the throat, without being produced into a stripe, as in *P. concinna*. Bill black, with the base of the lower mandible horny; feet very pale flesh-colour; iris black.

Total length $7\frac{1}{4}$ inches; wing $4\frac{5}{8}$ inches; bill, from gape, $1\frac{1}{8}$ inch.

Hab. Sula Island (Xulla of the English maps), E. of Celebes.

Remark.—This species differs from its nearest allies by its very strong bill, as well as by the peculiarities of colouring above described. It is very like Temminck’s figure of *P. irena* from Timor; but that species appears to have much more blue on the back, and the bill entirely black, and not so strong. It is also highly improbable that the same bird should be found in such distant localities, when so many of the neighbouring islands have each their peculiar species.

DESCRIPTIONS OF NEW SPECIES OF REPTILES AND FISHES IN THE COLLECTION OF THE BRITISH MUSEUM. BY ALBERT GÜNTHER, M.A., M.D., PH.D., F.Z.S.

CHLOROSCARTES.

(Fam. AGAMIDÆ.)

Head short, body and base of tail compressed, tail exceedingly long. Head covered with numerous smooth, small shields; all the scales keeled, small, those of the belly and tail being the larger; scales on the throat conical. Femoral pores very prominent, in a longish series; præanal pores none. A low crest of triangular scales on the neck; a series of enlarged, sharp scales along the median line of the back and tail. Fingers five, and toes five, all elongate, and armed with sharp claws; the middle toe fringed along the basal joints. Throat with a small pouch and cross fold. No prominent scales at the ear.

CHLOROSCARTES FASCIATUS.

Grass-green, with three very broad dark-green cross bands.

Feejee Islands.

Description.—Head rather elevated and obtuse; pouch below the throat and transverse fold in front of the shoulder well developed; body and basal portion of the tail compressed, the latter rounded in the middle and posteriorly, tapering, three or four times as long as the body. The fore limbs extend backwards to the loin; the third and fourth fingers are equal in length. The hind limbs are as long

as the trunk; the third toe has a series of enlarged triangular scales along its inner margin, forming a serrated edge.

Shields on the upper and lateral parts of the head very numerous and smooth. Nostril in a single somewhat elevated shield, situated above the second and third upper labials. Rostral shield much broader than high, subtriangular; nine upper labials, the posterior being considerably lower than the anterior; there are three or four series of small shields between the labials and the eyelid; eyelids entirely scaly. Seven lower labials; scales on the throat conically elevated. Scales of the upper parts of the body very small, of equal size, each with a short keel or conical protuberance. A low crest, formed by compressed triangular scales, runs from the occiput towards the middle of the tail, where it is gradually lost. Scales on the belly in transverse, slightly oblique series, small, but much larger than those on the sides, strongly keeled. Limbs with keeled scales of moderate size. The scales of the middle and posterior parts of the tail are much larger than those on its basal portion; all are keeled, the keels forming continuous longitudinal ridges. Each femur with a series of twelve to fourteen large pores filled with a greasy substance; præanal pores none.

Tympanum larger than the eye.

Each jaw with eighteen to twenty teeth on each side; teeth tricuspid, the lateral points being small; palatines with small teeth posteriorly.

Bright grass-green; head and nape of the neck, three broad cross bands on the trunk, and about fourteen broad rings round the tail dark green. Nasal shield white.

	inches.	lines.
Total length.....	27	0
Length of head (to tympanum).....	1	2
„ trunk (from tympanum to vent) .	4	5
„ tail	21	6
„ fore limb	2	11
„ third finger	0	9
„ hind limb	4	0
„ third toe	1	0
„ fourth toe	1	3

PHRYNOBATRACHUS.

(Fam. RANIDÆ.)

Skin with large flat warts. Fingers quite free; toes half-webbed; head pointed; tongue elongate, deeply notched behind; vomerine teeth none; eustachian tubes small, tympanum entirely hidden.

Port Natal.

PHRYNOBATRACHUS NATALENSIS.

A fold of the skin between the fore limbs; greyish olive, marbled with darker. Metatarsus with two tubercles, tarsus with a third on the middle of its inner edge.

Description.—Forehead flattish, without canthus rostralis; sides

of the head subvertical; snout somewhat pointed and rather longer than the eye; eyes of moderate size, with round pupil, rather distant; a fold in front and behind the orbit. Inner nostrils and eustachian openings small; lower jaw without prominences; tongue longish, deeply nicked behind. Body and limbs rather stout; back and sides with numerous large, smooth glands; belly smooth; an indistinct cross fold between the fore legs. The fore leg, if laid backwards, does not extend to the vent; fingers and toes tapering; the first and third fingers are equal in length, and longer than the second and fourth. Hind legs much longer than the body; toes two-thirds webbed, the third a little longer than the fifth. Dark-greyish olive, marbled with darker; an indistinct light streak between the eyes. Lower parts dirty whitish; throat with some obscure dark spots.

	lines.
Length of the body	15
„ fore leg	8
„ hind leg	23
„ tarsus with fourth toe	7½

A single specimen was in a collection sent by Mr. T. Ayres from Port Natal.

CENTROPOGON MARMORATUS.

D. $\frac{16}{9}$. A. $\frac{3}{6}$. V. $\frac{1}{5}$. L. lat. 68.

The third to sixth dorsal spines are the longest, half as long as the head; the second anal spine longer and stronger than the third. Yellowish, marbled with brown.

Moreton Bay.

Description.—This species is similar to *Centropogon australis*, from which it will be readily distinguished by the shorter third dorsal spine, which in *C. australis* is two-thirds as long as the head. The height of the body is contained thrice and a half in the total length; the length of the head thrice and a quarter. Head slightly compressed, with deep grooves along the interorbital space, which is concave and much narrower than the orbit; there is a slight groove behind the orbits, across the occiput. Snout shorter than the eye, the diameter of which is scarcely more than one-third of the length of the head. Cleft of the mouth slightly oblique, of moderate width, the maxillary extending beyond the front margin of the orbit; jaws equal in length anteriorly. Each turbinal bone with an obtuse spine superiorly; præorbital spine strong; præoperculum with five spines, the upper of which is the longest; operculum with two ridges; spines on the occiput small and obtuse. Head naked, without cutaneous appendages; vomerine teeth in a narrow angular band.

The dorsal fin commences immediately behind the occiput, its spines are of moderate length and strength; the third to the sixth are the longest, half as long as the head; the following decrease in length, the last, again, being a little longer than the penultimate; the soft dorsal rather more elevated than the spinous, short, the length of its base being contained thrice and a fifth in that of the spinous

dorsal. Caudal fin scaleless, rounded, contained four times and two-thirds in the total length. The anal commences opposite the fourteenth dorsal spine; its second spine is the longest, contained twice and two-thirds in the length of the head. The pectoral has the rays branched, and extends nearly as far backwards as the ventral, which is composed of a strong spine and five soft rays; the region round the base of the pectoral and ventral fins is naked, covered with soft skin.

The gill-membranes are scarcely united below the throat. There is a distinct cleft behind the fourth gill*.

Length of the specimen, 3 inches.

CATOPRA SIAMENSIS.

D. $\frac{13}{15}$. A. $\frac{3}{9}$. L. lat. 27. L. transv. $\frac{5\frac{1}{2}}{13}$.

The height of the body is contained twice and a third in the total length. Cheek with six series of scales, the lower of which covers the præopercular limb. Body with eight dark cross bands; scales on the nape with some minute whitish dots; the outer edge of the ventral white.

Siam.

Description.—The height of the body is contained twice and a third in the total length, the length of the head thrice and a third; head as high as long. Snout rather shorter than the eye, the diameter of which is one-fourth of the length of the head, and equal to the width of the interorbital space. The lower jaw is scarcely longer than the upper, and the maxillary extends slightly beyond the anterior margin of the orbit. Two nostrils remote from each other, both very small. Præorbital and angle of the præoperculum slightly serrated; opercles, throat, and isthmus entirely scaly. The dorsal fin commences above the end of the operculum, and terminates close by the caudal; its spines are very strong, and can be received in a groove; the fifth, sixth, and seventh are the longest, not quite half as long as the head; the last spine is shorter than the penultimate; the soft dorsal is elevated and scaly at the base. The second anal spine is exceedingly strong, rather stronger and longer than the third, and not quite half as long as the head; the soft anal is similar to the soft dorsal. Caudal fin rounded, slightly produced, one-fourth of the total length; its basal half is scaly. Pectoral rather narrow, as long as the head without snout. The ventral is inserted immediately behind the base of the pectoral; it has a strong spine, and extends to the vent.

Scales minutely ciliated; the upper part of the lateral line terminates below the last dorsal rays, the lower commences above the third anal spine.

Gill-membranes united below the throat, not attached to the

* I have been induced by that circumstance to re-examine *C. australis*, and have found a very small opening behind the fourth gill; so that the presence of such a narrow cleft is to be introduced into the diagnosis of the genus *Centropon* (Catal. Fish. ii. p. 128).

isthmus, scaly. Four gills, a slit behind the fourth; pseudobranchiæ none.

The jaws, vomer, palatines, and upper and lower pharyngeals are armed with bands of small villiform teeth. Very remarkable are two large, ovate, dentigerous plates, one at the roof, the other at the bottom of the mouth, in front of the pharyngeals; these plates are slightly concave in the middle, pavementated with molar-like teeth, and have evidently the same function as the pharyngeal dentigerous plates of the true Pharyngognathi.

Total length 52 lines.

When I composed the generic characters of the genus *Catopra* from Bleeker's accounts, I had not seen a specimen of these fishes, and I described their peculiar dentition in very indistinct terms. The teeth ought to be described thus:—Villiform teeth in the jaws and on the vomer and palatine bones; a large patch of molar-like teeth on the præspenoid and on the basihyal.

CATOPRA TETRACANTHUS.

D. $\frac{15-16}{11}$. A. $\frac{4}{8}$. L. lat. 26. L. transv. 3/9.

The height of the body is nearly one-third of the total length. Cheek with four series of scales, the lower præopercular limb being naked. Coloration uniform?

East Indies.

Description.—The height of the body is nearly one-third of the total length, the length of the head two-sevenths; head a little longer than high. The length of the snout equals the diameter of the eye, which is contained thrice and two-thirds in the length of the head. The width of the interorbital space is considerably less than that of the orbit. The lower jaw is scarcely longer than the upper, and the maxillary extends slightly beyond the anterior margin of the orbit. Two nostrils remote from each other, the anterior minute. Præ-orbital and angle of the præoperculum slightly serrated; opercles, throat, and isthmus entirely scaly. The dorsal fin commences above the root of the pectoral, and terminates at a short distance from the caudal; its spines are of moderate strength, those in the middle being the longest, a little more than one-third of the length of the head; the last spine is a little longer than the penultimate; the soft dorsal is somewhat elevated and not scaly. The three posterior anal spines are nearly of equal length and strength, two-fifths of the length of the head. Caudal rounded, scaly at the base, one-fourth of the total length.

Scales minutely ciliated.

The jaws, vomer, palatines, and upper and lower pharyngeals are armed with bands of small, villiform teeth, the jaws having a pair of small canine-like teeth anteriorly. The roof and the bottom of the cavity of the mouth have an elongate band of granular teeth, the lower not being confluent into one plate.

The coloration appears to have been uniform.

Two specimens, 54 lines long, were transferred from the collection of the East India Company to the British Museum.

PSEUDOCROMIS PERSPICILLATUS.

D. $\frac{3}{25}$. A. $\frac{3}{14}$. L. lat. 45.

Reddish-olive (in spirits), with a chestnut-brown band running from the extremity of the upper jaw through the middle of the eye to the middle of the base of the dorsal fin; the band is very dark and slender anteriorly, gradually becoming lighter and broader posteriorly.

China.

Description.—The height of the body equals the length of the head, and is contained thrice and a third in the total (without caudal). Head longer than high; cleft of the mouth oblique, with the jaws subequal anteriorly, and with the maxillary extending to behind the vertical from the front margin of the orbit. Snout a little longer than the orbit, the diameter of which is one-fourth of the length of the head. The width of the interorbital space, which is scaly, is less than that of the orbit. The lower jaw with two, the upper with three pairs of canine teeth. Scales on the cheek in six series. Caudal fin subtruncated, with an upper and lower ray produced into a filament.

Several specimens are in the collection of the British Museum; one of the largest is 42 lines long.

AMBLYOPUS SAGITTA.

D. $\frac{6}{21}$. A. $\frac{1}{20}$.

The height of the body is one-twelfth of the total length; vertical fins united; caudal very long, arrow-shaped; teeth small, in a single series; eyes rudimentary.

California.

Description.—Body elongate, compressed, covered with small, imbricate, cycloid scales, which become larger posteriorly. Head elongate, subquadrangular, one-seventh of the total length (with the caudal), and two-thirds of the distance between the vent and the base of the ventral fin. Teeth very small, subhorizontal, in a single series. Cleft of the mouth oblique, rather wide, the maxillary extending to behind the eye; lower jaw prominent; eye very small. Ventral fins confluent; caudal arrow-shaped, nearly one-fifth of the total. Pectoral as long as the ventral, and half as long as the head. Upper parts grey, lateral and lower silvery; an ovate grey spot before each dorsal ray; caudal grey.

Four specimens of this fish have been procured for the British Museum. The largest of them is $9\frac{1}{2}$ inches long.

This is the most aberrant form of the genus *Amblyopus*; although closely allied to *A. Broussonetii*, it differs in its more feeble dentition and in its larger scales. *A. Broussonetii* has 11/16 vertebræ, *A. sagitta* 11/20. If the genus *Gobioides* of Lacépède be adopted, another must be created for *A. sagitta*, and the sections may be arranged as follows:—

AMBLYOPUS, Gthr.

A. Teeth in a band, with an outer series of stronger ones.

* More than twenty-five soft dorsal rays : *Amblyopus*, C. & V. East Indies.

** Less than twenty soft dorsal rays : *Gobioides*, Lacép. Peru and Guayaquil.

B. Teeth in a single series : *Tyntlastes*. California.

DESCRIPTIONS OF SOME NEW CORALS FROM MADEIRA.

BY JAMES YATE JOHNSON, COR. MEM. Z.S.

Fam. ACANTHOGORGIADÆ, J. E. Gray.

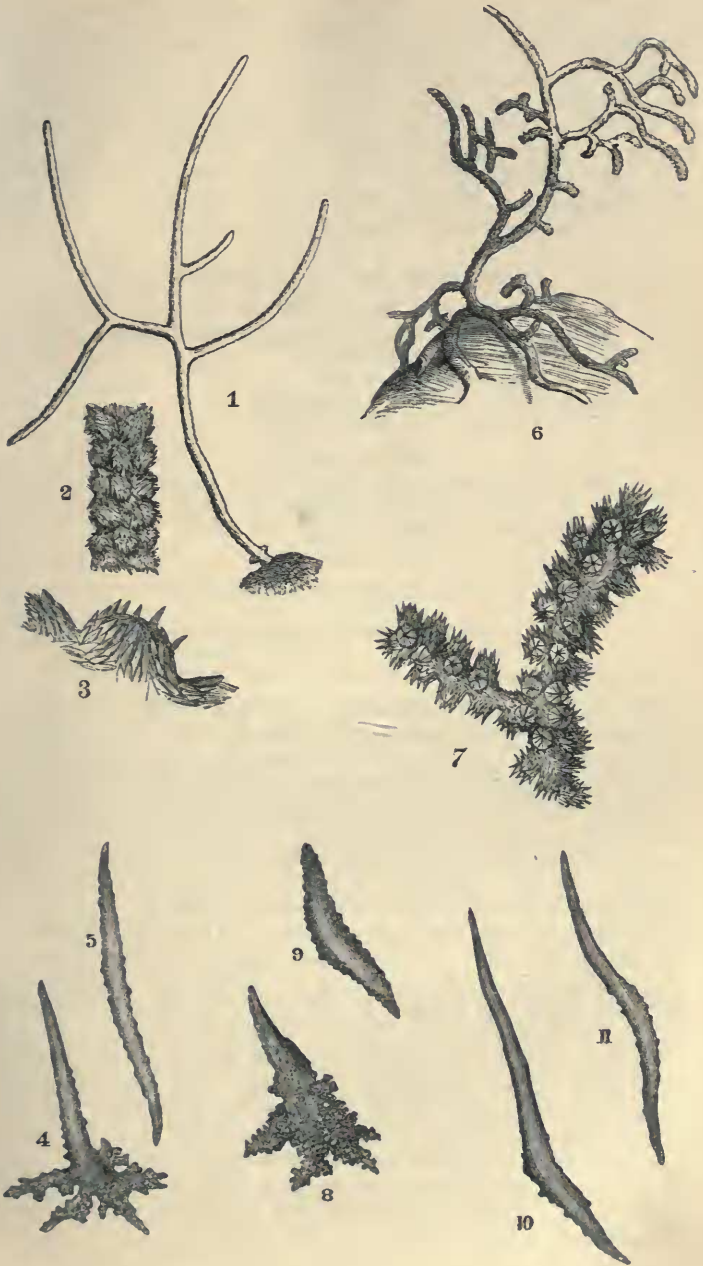
ACANTHOGORGIA ATLANTICA, sp. n.

Since the occurrence of a specimen of *Acanthogorgia Grayi*, of which I laid a description before the Society last year (Ann. Nat. Hist. 1862, ix. 75), another form of the genus has been discovered. This was brought up from deep water at Madeira, having become entangled in a fisherman's line. As there are obvious distinctions from the two other species of this genus, I shall venture to describe it as new.

It is of a dark-brown colour, and is very sparingly branched in one plane. The base spreads out in thin branching sheets amongst small shells and fragments of stone which adhere to it. The stem and branches, with their closely packed cells, are cylindrical, the former not much thicker than the latter. The branches are rounded at their extremities. The cells are short, cylindrical, sessile, and so crowded on all sides of the stem that they conceal it from view; whilst in the two other species of this genus the cells are widely separated, and the bark is seen between them. When the polypidom is dry, a brown, slender, horny axis, without spinulæ, stands distinct from the bark, as in the other species. This axis, when softened and submitted under pressure to the microscope, is seen to consist of fibres bearing a general similarity to those composing the axis of *Antipathes*. Round the orifice of each cell project large spicula, and smaller spicula strengthen the sides of the cells and the bark. The spicula are intermediate in character between those of *A. hirsuta* and *A. Grayi*, being less slender than those of the first species, and less stout than those of the second. The great spicula round the mouth of the cell have their exposed portions spinulose or tuberculated (not smooth as in *A. hirsuta*); their bases are branched (as in *A. Grayi*), and they are much less marked with the tubercles which roughen the bases of the last-named species so remarkably.

This species is distinguishable from the other two by the greater crowding of the cells, by the cells themselves being sessile and being therefore less prominent, by the paucity of the ramifications, and by the differences in the spicula already pointed out. In habit it is very distinct.

The specimen (which is now in the British Museum) has a height



of 13 inches, and its branches have a spread of about 11 inches. The stem, with its cells, has a diameter of $3\frac{6}{10}$ of an inch, and the branches with their cells are only reduced to two-thirds of that diameter. Near the base are the stumps of two branches which have been broken off. Above, on one side, are two simple branches, and on the other a single forking branch. These three branches are placed not far apart near the middle of the main stem.

It ought to have been mentioned, with reference to the woodcuts of *A. Grayi* and *A. hirsuta* (Ann. Nat. Hist. 1862, ix. 75, 76), that the figures are considerably larger than the natural size.

DESCRIPTION OF THE WOODCUTS.

Acanthogorgia atlantica.

- Fig. 1. Outline of the entire specimen, on a reduced scale.
 Fig. 2. Portion of a branch, enlarged.
 Fig. 3. A cell more highly enlarged.
 Fig. 4. A spiculum from the edge of a cell.
 Fig. 5. A spiculum from the side of a cell.

Acanthogorgia Grayi.

- Fig. 6. Outline of a portion of the coral, on a reduced scale.
 Fig. 7. A branch, enlarged, for comparison with fig. 2.
 Figs. 8, 9. Spicula from the edge and side of a cell.

Acanthogorgia hirsuta.

- Figs. 10, 11. Spicula from the edge and side of a cell.

Fam. STYLASTERIDÆ.

ALLOPORA MADERENSIS, sp. n.

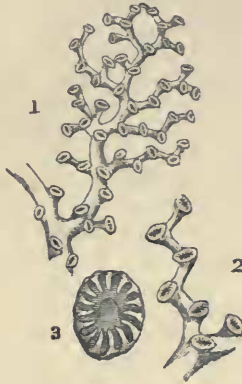
Opake white. Much and closely branching nearly in one plane, the branches becoming gradually of less diameter, and sometimes anastomosing. They zigzag from cell to cell; and the surface is finely reticulato-striate, but is without any tubercles. The cells are oblong, sessile, and always placed transversely to the branch, upon one face of the plane. The terminating cells, with their pedicels, are trumpet-shaped, but with oblong mouths, which are much wider than the stalk below. The margin of each cell is elegantly notched with from twelve to sixteen notches, with laminæ between.

The dimensions of the single specimen that has occurred (now in the British Museum) were $3\frac{1}{2}$ inches high and $2\frac{1}{4}$ inches across. The base had been broken away, and the thickest part of the remaining stem was $\frac{1}{5}$ th of an inch in diameter. The longer axis of the terminal cells measured the twentieth of an inch.

The specimen was brought up by a long fishing-line on the coast of Madeira. Two examples of that curious patelliform shell the *Pedicularia sicula* were found seated on the branches. With respect to this circumstance, I may mention that Mr. S. P. Woodward has shown me a coral from the coast of Sicily, belonging to a totally distinct genus, with *Pediculariæ* upon it; and in the Coral Room at the British Museum there is another coral with the same shell still adhering to it.

The present form, though at the first glance it seems to have a general resemblance to *A. flabelliformis*, is quite distinct from that species, having the cells much larger and transversely oblong, not round. Moreover, the zigzag character of the branches is much more marked. It may, however, be worth inquiry whether it may not be the *A. infundibulifera* of Lamarck.

A. maderensis appears to show that the genera *Stylaster* and *Al-*



Allopora maderensis.

Fig. 1. A branch, with its ramuli, of the natural size.

Fig. 2. A ramulus magnified.

Fig. 3. A cell more highly magnified.

Allopora ought to be united; for though there are no “petites pointes” or “tubercules vésiculaires” upon this coral (M. Milne-Edwards giving this as one of the characters of *Stylaster*), yet the gemmation is alternate and distichal—the same writer saying of *Allopora* that its gemmation is “tout-à-fait irrégulière.”

DESCRIPTION OF TWO NEW SPECIES OF CORALS BELONGING TO THE GENUS FLABELLUM. BY E. W. H. HOLDSWORTH, F.L.S., ETC.

1. FLABELLUM CAMPANULATUM.

Compressed, campanulate; borders straight or slightly convex; without spines. Base usually terminating in a small pedicel, sometimes irregularly compressed. Superior margin slightly arched. Cell deep and narrow. Border of lamellæ entire, sloping inwards from the apex for about one-third of their length, thence continuing straight to the bottom of the cell. Columella indistinct. Five principal lamellæ in half an inch. Height 14 lines; breadth 16 lines; proportion of axes 7 : 16.

Specimens in the British Museum are rather longer in proportion than those in my possession; but the variation is not very great.

Hab. Philippines.

This coral is very neat and symmetrical, and can hardly be confounded with any other species.

2. FLABELLUM NOBILE.

Much compressed throughout, elongated. Borders rather concave, with four or five root-like appendages more or less distant from the base, but closely united throughout their length to the lower half of the coral. These appendages spring from and are continuous with the transverse epithecal ridges which mark the successive periods of increase in the coral, and, although now intimately united to the main stem, are evidently of extraneous growth, corresponding in origin and nature with the ordinary form of spines, but taking a downward direction to increase the basal area. Upper margin of the coral slightly arched. Cell very deep and narrow. Margin of lamellæ entire, and gradually curving from apex to base, at which point opposite series of the larger plates almost unite. No columella perceptible. Four principal lamellæ in half an inch.

The two specimens which have furnished the above description are of different ages. The smaller and more perfect example is attached to the upper margin of the flat side of the larger one, and has grown in nearly the same vertical direction. It measures 2 inches 6 lines in height, and 1 inch 10 lines in greatest breadth. The older example is 2 inches 6 lines in the long diameter, and 1 inch 3 lines in the short. The base of this specimen is imperfect; so that the original length of the coral cannot be certainly ascertained.

This species is intermediate between the genera *Flabellum* and *Rhizotrochus*, having the usual compressed shape of the former, with a partial development of the radiceform appendages of the latter remarkable genus. The peculiar situation of the smaller specimen is perhaps worthy of notice, as being one in which the supplemental props are especially useful in aiding the attenuated base to support the long and heavy coral. A similar tendency to parasitic growth, or rather adhesion to another individual of its own species, may be observed in Milne-Edwards's figure of the type-specimen of *Rhizotrochus**. The species now under consideration should, I think, be placed in the genus *Flabellum*, although differing in some of its characters from most of the typical forms; and as it is the largest member of the genus, I propose to call it *nobile*.

The precise habitat of this coral is unknown. It was brought to this country by the late Sir Everard Home; and as that gentleman's collections were principally made in the neighbourhood of Australia and New Zealand, these corals were probably obtained from the same part of the world.

The specimens are now in the Museum of the Royal College of Surgeons of England.

* Milne-Edwards et J. Haime, Ann. des Sc. Nat. 3^e sér. t. ix. p. 282, pl. 8. f. 16, 1848.

ON THE OCCURRENCE OF *CARYOPHYLLIA CLAVUS* ON THE COASTS OF BRITAIN, WITH SOME REMARKS ON THE CIRCUMSTANCES AFFECTING THE DISTRIBUTION OF CORALS AROUND THE BRITISH ISLANDS. BY E. W. H. HOLDSWORTH, F.L.S., F.Z.S., ETC.

By the kindness of the Rev. Thomas Hincks of Leeds, I have recently been enabled to examine some specimens of coral which had been forwarded to him from Shetland, and from Loch Fyne on the east coast of Scotland. They prove to be new to Britain, and are identical with the *Caryophyllia clavus* of the Mediterranean, first described as a fossil by Scacchi in 1833, and figured and described from recent specimens under the name of *Cyathina turbinata* by Philippi in his 'Catalogue of Sicilian Mollusca,' published in 1836. Several examples of this coral have been obtained from deep water in the above-mentioned localities; and an examination of characteristic specimens of different ages has enabled me also to identify with this species two small and much-worn corals which, in June 1857, were dredged from a depth of 60 fathoms, about forty miles west of Scilly, by Mr. S. P. Woodward of the British Museum, and kindly placed in my hands a short time ago by that gentleman.

This species of *Caryophyllia* may be readily distinguished from its near ally, our common *C. Smithii*, by its conical form and finely pointed base, as well as by the thinness of its walls and lamellæ. The general character of the polype, as described by Philippi*, agrees with that of *C. Smithii*; the integuments, however, are said to be excessively delicate and transparent, so that the borders of the lamellæ can be seen through them. The body is of an orange-colour, and the capitate tentacles whitish with metallic-green reflections. The coral is frequently attached to a tube of *Ditrupa*, or the shell of some deep-water univalve, or, in some cases, is entirely free. In the British Museum are several specimens of this coral which were brought from Sicily. These are all attached to a species of *Turritella*. The occurrence of this second species of *Caryophyllia* in three distinct localities on our coasts entitles it to a place among our British corals; and further investigation will probably show it to be generally distributed in the deep water along our western shores.

It may not be uninteresting to inquire here into the distribution of corals around the British Islands, and to trace, as far as possible, the cause of their frequenting only particular lines of coast.

The existence of the coral-polype in our seas is mainly dependent on the warmth and purity of the water. A tolerably high temperature is undoubtedly one of the most necessary conditions for the well-being of the delicate polypes whose calcareous lamellated skeletons constitute the true stony corals. Only within the Tropics do we meet with those vast reefs and extensive accumulations of coral-growth which form so characteristic a feature of the seas in those warm latitudes. The surface-water there becomes heated by the direct influ-

* Arch. für Naturgesch. t. i. p. 42, 1842.

ence of the sun, and, in those regions, few coral-polypes carry on their ceaseless work at a greater depth than 30 fathoms, thence building upward to the lowest tide-mark. As we come towards more temperate regions, the species diminish both in size and number; simple forms become proportionately more numerous, and their bathymetrical range is greatly increased.

The waters of north-western Europe might be expected generally to be too much within the influence of Polar temperature to be fitted for coral-life, even in its simplest form; yet in our own seas, and extending far into the Arctic Ocean, are found some few species vying with the productions of the Tropics in brilliancy of colouring and delicacy of structure. Here, however, we have a peculiar and extraneous source of warmth in the Gulf Stream, whose waters, now becoming widely diffused, but still retaining some portion of their original excessive temperature and motion, exercise a sensible influence on the coast-productions of the western side of the British islands. The course of the current in the neighbourhood of our shores is marked sparingly, but distinctly, by the presence of eight or ten species of living coral.

The long list of *habitats* recorded by Mr. Gosse in his valuable 'Actinologia Britannica' has been of great use to me in tracing the range of our native species; and although many parts of the coast have been but little worked, enough has been done to furnish a tolerably clear outline of the distribution of the coralligenous polypes. From the writings of Maury and others, it appears that the Gulf Stream is divided by the British Islands; one portion going southward to the Bay of Biscay, the other and main body of the current sweeping away to the north by the Orkneys and Shetland. The entrance of the English Channel and the Irish Sea would thus be under the most direct influence of the warm current; and it is in these waters we find corals most abundant. Devonshire and Cornwall are extremely rich in these productions; and, including Weymouth Bay (the only recognized locality for *Hoplanguia durotrix*), the south-western promontory of England can boast of five out of the eight undoubted British species. They consist of two *Caryophyllia*, one *Sphenotrochus*, *Balanophyllia*, and *Hoplanguia*. Of these species, Guernsey produces two. *Caryophyllia Smithii*, the commonest species in the West of England, where it is found close to low-tide mark, ranges along the eastern and northern coasts of Ireland and the West of Scotland as far as Shetland, gradually increasing its depth of water as it proceeds north. It has also been met with on the western coast of Ireland; but very little has been done as yet in exploring the Atlantic sea-board of that island. Among the Hebrides and Orkneys, the fine branching coral *Oculina prolifera* has on rare occasions been met with, but only in deep water. Two species of *Caryophyllia* and the large scarlet *Ulocyathus arcticus* have been obtained in 80 or 90 fathoms near Shetland; the last-mentioned coral has also been taken by Sars at a depth of nearly 200 fathoms near the North Cape. Three other little corals have been dredged in the Moray Frith, and placed by Mr. Gosse in the genus *Paracyathus* of

Milne-Edwards. The specimens, however, are so young and imperfect that it is difficult to determine their specific characters.

If we now turn to the eastern side of Great Britain, and inquire whence come the waters of the German Ocean, we find them to be mainly of Polar origin, brought from the far north by the great surface-current which washes all the Norwegian and our own eastern coasts. To this must be added the comparatively fresh water which pours through the Sound, loaded with all the drainage of the Baltic. How does this cold and impure water affect the production of corals? Its influence is not less marked than that of the warmer western current. Through the entire length of the North Sea, from the north-eastern point of Scotland to near the Isle of Wight, I have been unable to ascertain that a single specimen of coral has ever been taken. That line of coast is also very deficient in *Actinæ*; and of the few that are found there, most are of the commonest species. This cold water from the north, however, also skirts the western coast of Scotland and Ireland; but it is only as a narrow superficial current; and when corals are found in its neighbourhood, they are only in the deep water of the great Atlantic stream, which, still retaining some of its excess of saline matter, sinks deeper and deeper as it meets the fresher and lighter, although colder, water from the north. Thus, as has been observed, all the northern corals are found in deep water, even the same species which on the Devonshire coast is abundant at low-water mark. The late Edward Forbes, in his 'Natural History of the European Seas,' remarks that the characteristic fauna of the "Arctic province" is only to be observed in the littoral regions, and the animals from deep water are all of them southern forms.

What has been pointed out as to the causes of the particular distribution of the British corals, namely, the effect of warm and cold currents, equally applies to the formation of coral-reefs within the Tropics. A comparison of Maury's Chart of the "Sea-drift" with Darwin's Map of the Distribution of Coral-reefs would lead one to suppose they had been prepared by the same hand. I will mention two remarkable cases as illustrations. A well-known barrier-reef extends some hundreds of miles along the north-east coast of Australia; its southern limit is near Moreton Bay; and a reference to Maury's Chart shows this to be the precise point at which a cold current from the South Pole meets the warm equatorial current from the east. Again, it appears somewhat remarkable that along the whole western coast of North and South America no vestige of coral has been found. Mr. H. Cuming informs me that he has dredged in vain for specimens of these characteristic tropical productions in the Bay of Panama and at the Galapagos; but the chart shows that cold currents from the north and south sweep the whole western coasts of America, meeting at the Equator, and then turning away into the Pacific, where, under a vertical sun, the water soon becomes warm enough for the growth of the various coral-reefs scattered about in that ocean. Fresh water and sediment of any kind being present act as fatal barriers to the growth of coral; and to these

causes may generally be traced gaps in reefs, and waste places of limited extent in those seas which especially abound in corals. Dana has recognized the effect of warm and cold currents in the general distribution of corals throughout the warmer seas; and the fact of the same influences being at work, and easily recognized, in the waters surrounding the British Islands appears sufficiently interesting to justify me in bringing the subject before this Society.

MISCELLANEOUS.

Pliocene Fossil Fauna of the Niobrara River, in Nebraska.

By JOSEPH LEIDY, M.D.

THE researches of Dr. Leidy upon the Lower Miocene Fauna of the *Mauvaises Terres* are well known through his important memoir on the "Ancient Fauna of Nebraska," published in vol. vi. of the 'Smithsonian Contributions.' But the results of the geological survey, by Dr. F. V. Hayden, of the Pliocene deposits along the Valley of the Niobrara are less generally known. We have hitherto deferred noticing them, in the expectation that a detailed memoir, with illustrations, would have appeared on the subject by Dr. Leidy, as in the case of the Nebraska fauna above referred to; but as that has not yet taken place, a brief account of the results may be of interest.

The following is a list of the fossil Mammalia discovered in the Pliocene beds of the Nebraska, as determined by Dr. Leidy:—

RUMINANTIA.

Merycodus necatus, *Leid.*
Megalomeryx niobrahensis, *Leid.*
Procamelus occidentalis, *Leid.*
 — *gracilis*, *Leid.*
 — *robustus*, *Leid.*
Merychys elegans, *Leid.*
 — *medius*, *Leid.*
 — *major*, *Leid.*
Cervus Warreni, *Leid.*

Hipparion (*Hippotherium*) *speciosum*,
Leid.
Merychippus insignis, *Leid.*
 — *mirabilis*, *Leid.*
Equus excelsus, *Leid.*
 — (*Protohippus*) *perditus*, *Leid.*

RODENTIA.

Hystrix (*Hystricops*) *venustus*, *Leid.*
Castor (*Eucastor*) *tostus*, *Leid.*

CARNIVORA.

Leptarectus primus, *Leid.*
Felis (*Pseudaelurus*) *intrepidus*, *Leid.*
Ælurodon ferox, *Leid.*
Canis sævus, *Leid.*
 — *temerarius*, *Leid.*
 — *vafer*, *Leid.*
 — *epicyon*, *Leid.*

MULTUNGULA.

Rhinoceros crassus, *Leid.*
Mastodon (*Tetraloph.*) *mirificus*, *Leid.*
Elephas (*Eueleph.*) *imperator*, *Leid.*

SOLIDUNGULA.

Hipparion (*Hippotherium*) *occidentale*, *Leid.*

The first point of general interest in the above list is the entire absence of Edentate forms in the Niobrara fauna. The same observation applies to the Miocene fauna of the "*Mauvaises Terres*," while *Megatherium*, *Megalonyx*, and *Mylodon* occur extensively in the United States; and the leading characteristic of the fossil fauna